



SIGTTO

Continually promoting best practice in the liquefied gas shipping and terminal industries



SIGTTO

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MESSAGE FROM GENERAL MANAGER

A year of celebrations ... and work

Andrew Clifton, the SIGTTO General Manager, looks forward to a busy 2014 and some of the unique anniversaries the year will bring

The Society had a very busy 2013. The year was dominated by the formation of the new non-governmental organisation (NGO) for the use of LNG as a marine fuel - the Society for Gas as a Marine Fuel (SGMF). As reported in the last newsletter, SGMF has now been fully established and is open for membership. It is very pleasing to see it getting stronger and stronger each month under the leadership of Mark Bell, the general manager. An update on developments at SGMF is given on page 6.

2014 is a very special year for both the LNG shipping industry and SIGTTO. This coming October marks the 50th anniversary since the first commercial discharge of LNG, at Canvey Island in the UK. This maiden cargo from Algeria was discharged by *Methane Princess* on 12 October 1964. In October it will also be 35 years since the formation of SIGTTO. We plan to mark both occasions at the Livorno Panel Meeting in October and also with a special supplement to go with the autumn newsletter.

It is a very exciting time to be working in the LNG shipping and terminal industry as there has never been a period quite like it. Today's growth is completely unprecedented, with more ships, terminals and SIGTTO members than ever before. I often wonder if the pioneers of 50 years ago ever imagined what the future might hold for the industry. There must have been some who wondered whether or not LNG shipping would establish itself at all. It is unlikely that they would have conjured up



SIGTTO techies - A gaggle of SIGTTO technical advisers and general managers past and present at Roger Roue's recent farewell party

images of vessels as large as the 266,000m³ Q-max class LNG carriers or Shell's Prelude floating LNG production (FLNG) unit.

Although the increased activity in our industry is to be welcomed, it brings with it further challenges. Not least of such challenges is the supply of sufficient ship crews, shore support staff and trainers to meet the manpower and skill set needs of a fleet much increased in size. The LNG shipping safety record is something we are justly proud of and many reading this article will have contributed towards our industry's strong performance over the years. That safety record does, however, remain our license to operate and we all have a 'collective responsibility' as an industry to maintain it as the gas shipping and terminal activities spread more widely and into new realms.

When mentioning the safety record, we also need to give credit to the pioneers who made key contributions to the establishment of a robust safety regime in the early days of LNG shipping. The centrepiece of this regime is the International Gas Carrier (IGC) Code, with its inherent safety margins and clear-cut provisions governing the design of safe ships and their equipment. These people are directly responsible for laying the foundation stones upon which our industry has built its excellent and unprecedented safety record over 50 years of commercial operations.

One such pioneer was Bob Lake and we ... **continued on page 3 >**

"Our industry owes a great deal to the pioneers who drafted the IGC Code and enabled us to compile our exemplary safety record."

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...continued from page 1 >

were saddened to hear the news of his recent passing. Representing the US Coast Guard, Bob chaired the ad hoc working group of what was then IMCO, now IMO, charged with drafting the IGC Code back in the early 1970s. In this position he played a key role in the development of a sound, robust document that the gas shipping industry could put its faith in. I often refer to Bob and his fellow LNG pioneers in presentations about LNG shipping safety. Bob was also a great supporter of SIGTTO and always expressed a great interest in our activities. The Society sends its most sincere condolences to his widow Claudia and the Lakey family.

The 58th SIGTTO Panel Meeting, kindly hosted by National Grid Grain LNG, was held in London last October and was a great success. The IMO Secretary-General, Koji Sekimizu, gave the keynote speech and around 200 members attended the two-day event. A great deal of positive feedback was received from those attending and further details of the Meeting can be found on page 7.

The SIGTTO Panama Canal project, which is producing guidance on all the technical aspects of an LNG vessel transit through the enlarged Canal, is almost complete. The publication was presented to the General Purposes Committee (GPC)

in March 2014 and will then go before the SIGTTO Board in May, hopefully leading to its publication soon after.

The Panama Canal initiative has proved to be a model project. The publication was written and completed within 12 months and credit is due to all those involved. We have also received exceptional support and co-operation from the Panama Canal Authority in compiling the document.

Many existing LNG vessels plus many of those under construction will require a degree of modification to enable Canal transits, although most of these modifications are expected to be minor in nature. The publication will highlight precisely what will be required. One key issue that has been agreed is that wires will not be permitted in the Canal. As a result all LNG vessels making a transit will have to have non-wire moorings on drums in place. Once the new locks are complete, LNG vessels up to 49 metres in breadth will be able to transit the waterway for the first time.

The London Secretariat office is currently undergoing some changes. Roger Roue, SIGTTO's long-serving technical adviser, retired at the end of last year. Photographs and details of his farewell celebration can be found on page 5. We are currently sourcing a replacement for Roger.

SIGTTO's office manager, Linda Murray, left London and SIGTTO at the end of March for Houston where her husband Andrew, who is with BG Group, has been relocated. Linda spent almost six years with the Society and will be missed. We wish her and Andrew the very best of luck in Houston. We also wish to welcome Andrea Baseley, Linda's replacement as office manager, to the Secretariat and the Society.

We have nine Regional Forums scheduled for 2014 as well as two Panel Meetings. The 59th Panel Meeting in Paris in May will be kindly hosted by Total while a technical visit to the laboratories of Gaztransport & Technigaz (GTT) has also been organised. A large turnout is expected and a profile of our host, Total, can be found on page 12.

The May Panel coincides with the meeting of the SIGTTO Board for the first time. Panel Meetings are usually held in tandem with GPC gatherings but this year's spring GPC is being held during the Gastech 2014 event in Seoul. Rather than cancelling it or trying to compete with Gastech, the 59th Panel has been put back by a couple of months, to May. The Autumn Panel will be held in Livorno, Italy in October and is kindly being hosted by OLT Toscana.

I am looking forward immensely to the year ahead and to meeting the membership over the course of 2014.

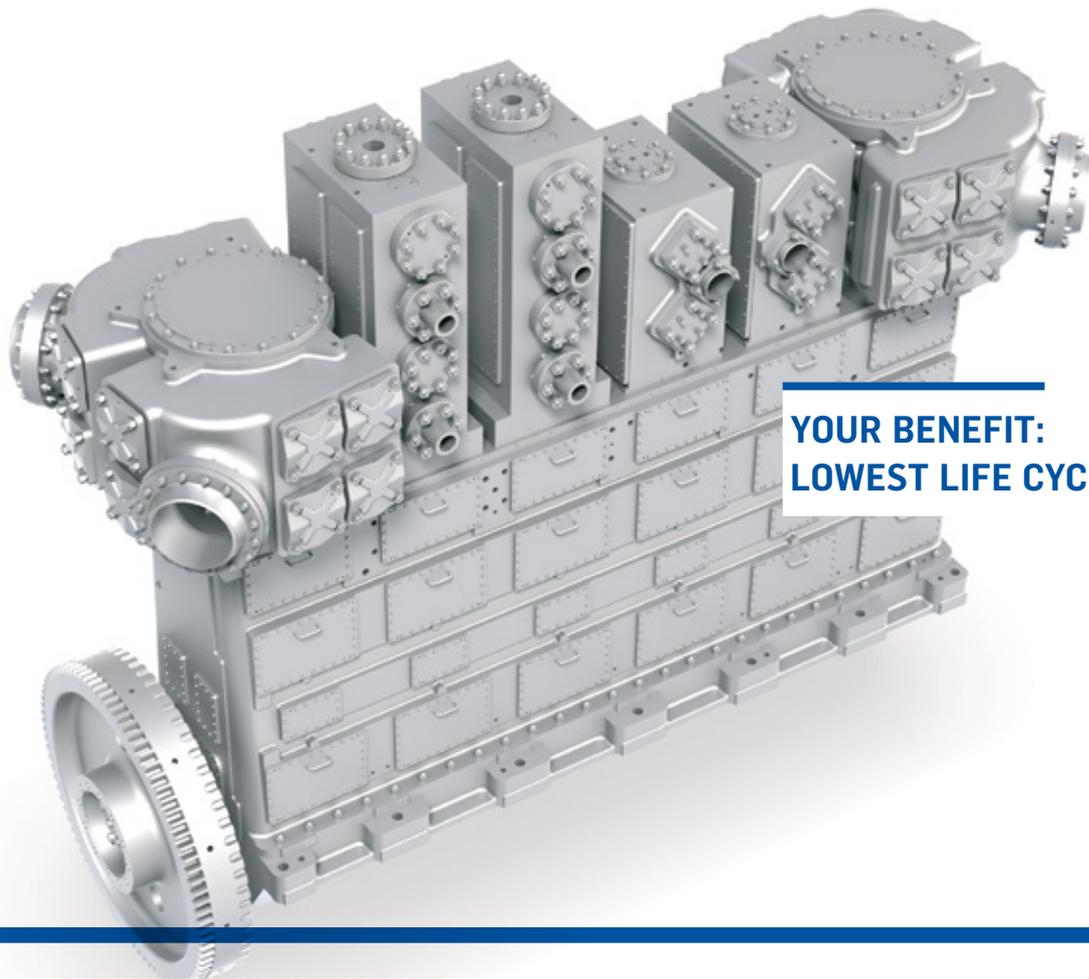
UPCOMING MEETINGS 2014

MEETING	DATE	LOCATION
69th General Purposes Committee	28 Mar	Seoul
Asia-Pacific Regional Forum	1 Apr	Singapore
Middle East & Africa Regional Forum	16 Apr	Doha
Spring Board Meeting	13 May	Paris
59th Panel Meeting	14-15 May	Paris
Panel Technical Visit - GTT	16 May	Paris
Mediterranean Regional Forum	29 May	Athens (TBC)
Pan American Regional Forum	24 Jun	Houston
South American Regional Forum	27 Aug	TBC
China Regional Forum	3 Sep	Shanghai (TBC)
70th General Purposes Committee	7 Oct	Livorno, Italy
60th Panel Meeting	8-9 Oct	Livorno, Italy
Panel Technical Visit - OLT Toscana	10 Oct	Livorno, Italy
Pan American Regional Forum	12 Nov	Houston (TBC)
Autumn Board Meeting	18 Nov	Oslo
Australian Regional Forum	10 Dec	Perth (TBC)
Scandinavian Regional Forum	TBC	Copenhagen

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RETIREMENT

Roger Roue - thanks for the memories

Roger Roue retired from SIGTTO at the end of 2013, after 16 years with the Society as Principal Technical Adviser and after a 50-year career in gas and shipping. When Roger joined the Society the LNG carrier fleet numbered just under 100 ships and he could, quite proudly, name them all.

Commencing his career as a marine engineer with Shell Tankers UK in 1964, he was promoted to chief engineer in 1980. Roger became a superintendent engineer for a London-based tanker operator in 1986 and the following year joined British Gas as the company's mechanical engineer at the Canvey Methane Terminal. In 1993 he transferred to the international arm of British Gas as an LNG project engineer. This posting involved working on a variety of feasibility studies, including the conversion of the Isle of Grain terminal into an LNG import facility, and developing the long-term maintenance programme for BG's LNG carriers.

His involvement with SIGTTO began in January 1997 and over the past 16 years he has been the only Technical Adviser directly employed by the Society. During the period Roger has been involved in many of the Society's key projects. Below, as a snapshot, is a list of just a few of the roles in which he has served and initiatives/publications in which he has participated:

- *Liquefied Gas Fire Hazard Management*
- *Gas Concentrations in the Insulation Spaces of LNGCs*
- *Contingency Planning for Marine Terminals Handling Liquefied Gases in Bulk*
- UK representative on several European LNG standards committees, including EN 1473 - Design of Onshore LNG Terminals and EN 1532 - LNG Ship/Shore Interface
- UK representative on ISO TC 67



One of Roger's favourite expressions was "Let's not re-invent the wheel!" - what better present to send him off with



Roger pictured with all his colleagues involved in the revision of the IGC Code that were able to attend the farewell party

which is responsible for LNG transfer equipment, amongst other things

- Assistance with the fire studies carried out at Sandia Laboratories
- Development work on the the International Code for Ships using Gas or other Low Flash-Point Fuels (IGF Code)

Roger spent the greater part of his last few years at SIGTTO on what was probably his greatest project - the updating of the International Gas Carrier (IGC) Code. SIGTTO facilitated the revision of this core industry document on behalf of IMO.

Roger has a remarkable memory and is able to recollect events from years back at the drop of a hat. In the Secretariat he would be referred to as our in-office

'Rogapedia'. If someone was trying to recall at what Panel Meeting someone gave a presentation, Roger would quickly reel off the location, date and session.

Besides being a great source of knowledge, Roger was always good fun, pleasant company and a great person to work with. He will be missed.

On a cold and damp evening this past January around 80 former colleagues, associates, friends and family gathered onboard *HMS President* on London's Embankment for a celebratory party to mark Roger's retirement. A great evening was had by all and Roger was given some mementos to mark the occasion!

SIGTTO wishes him all the best for a long and happy retirement.

BENEFITS OF SIGTTO MEMBERSHIP

SIGTTO members are actively encouraged to promote membership when dealing with any new players in the industry. Please direct them to our website and to the London Liaison Office for further details of how to join.

In addition to the credibility in the industry that membership brings, SIGTTO members benefit by:

- Access to information that is exclusive to members, such as casualty information and industry statistics
- Access to the Technical Advisers in the London Liaison Office who can give advice and obtain advice, on behalf of a member, from within the Society
- Access to the very comprehensive technical library maintained in the London Office
- Submitting proposals for projects and studies to the General Purposes Committee

- Participating in discussion forums with other members each year on topics of particular and mutual interest
- Contact details of all members of SIGTTO
- New members receive a copy of all publications, free of charge, produced by SIGTTO
- Regular updates on matters affecting the industry such as legislation, either new or pending, technical or operational developments.
- Free access to the LNGwebinfo portal for updated LNG information as required to conduct compatibility studies. This information is restricted to members of SIGTTO and GIIGNL only.



Brother organisation is up and running

Mark Bell, General Manager of SGMF, writes:

Maritime transportation, having gone from sail to steam and from coal to oil, is now moving towards natural gas as a prime source of energy in propulsion system and power generation applications.

As the world undertakes a dash for gas and the supply of gas becomes more abundant, the maritime industry has an opportunity to leapfrog ever-increasing and punitive emissions regulations by using this clean-burning fuel source. This acceptance of what is fast becoming the most sustainable and cost-effective source of energy yet utilised on ships represents the next stage in the evolution of marine propulsion.

There is a vast difference between carrying LNG in bulk on a ship and burning it for propulsive power. The Society for Gas as a Marine Fuel (SGMF) has recently been established as a framework organisation that can absorb the best of what industry has to offer in the drive to establish uniform and harmonised industry best practices. More specifically, SGMF's ultimate goal is to develop standards and guidelines that underpin the safe use of gas as marine fuel, leading to the more widespread use of this fuel and realisation of the many benefits stemming from such use.

Since its formation in autumn 2013 SGMF has set up shop in the City of London as a wholly separate, but complementary, non-governmental organisation (NGO) to SIGTTO. Much as the International Gas Carrier (IGC) Code has become the regulatory bible for LNG transportation, so the International Code for Ships using Gas or other Low Flash-Point Fuels (IGF Code)

currently being drafted will cover all matters pertaining to the use of LNG as fuel on ships.

Industry recognition that there is a significant difference between LNG transport and the use of LNG as fuel is permeating more widely, as reflected in the development of separate IGC and IGF Codes and, now, the establishment of SGMF. As the LNG bunkering concept grows and the LNG-fuelled vessel fleet grows, the need for such a new industry body has never been greater.

In the first six months since SGMF was established, 60 companies have joined the Society as members. The interest in SGMF reflects the rapid pace of developments in the LNG-powered vessel sector. News of LNG-fuelled newbuildings and ship conversion projects as well as developments in LNG bunkering logistics and infrastructure is now breaking almost daily. If anything, the pace is only expected to get quicker.

In March SGMF will form its Technical Committee, comprising individuals from 10 of the Society's founding board members. Already, before its first meeting, the Committee has a considerable number of items to address. These can be summarised as follows:

- **LNG as a marine fuel: safety guidelines**
- **LNG bunkering: safe distances**
- **LNG on ships: contingencies and issues for salvage**
- **LNG as a marine fuel: competence and training standards**
- **LNG bunkering: quality and quantity issues**

While many initiatives aimed at establishing rules for LNG-fuelled vessels are currently underway, especially in Europe and the US, the SGMF board believes that it will best serve the purpose of the Society's objective if it also tackles these regulatory issues first. It is hoped to issue the first revision of the SGMF Safety Guidelines in summer 2014 so the that Society can gain traction

and formulate best practice for our industry without compromising on content quality.

SGMF is also reaching out to other transportation bodies in the road, rail, aerospace and defence industries in order that the maritime sector may benefit from the lessons which others have had to learn the hard way.

Full membership in SGMF is open to all organisations directly involved in the use of LNG as a marine fuel, including shipowners, gas suppliers and other participants in the logistics chain. Associate membership embraces the wider industry and is open other parties with involvement in LNG-fuelled vessels, including equipment manufacturers, consultants, shipyards and designers.

Besides myself the SGMF London Secretariat currently comprises Krishna Ruparelia as Office Manager and Sharon Walters as Marketing and Membership Manager. www.socgmf.org

AUTUMN 2013 BOARD

Far-from-ordinary Commons dinner

SIGTTO's Autumn 2013 Board and Annual General Meetings were held at the Hyatt Churchill in London in November. After the business of the day was completed the Board adjourned to the historic surroundings of the nearby Houses of Parliament where dinner had been arranged.

Prior to the dinner the SIGTTO directors were taken on a tour of the UK seat of government, the highlights of which were the Palace of Westminster, the House of Lords and the House of Commons. The tour, complete with fascinating historical anecdotes, was followed by drinks in the balcony bar overlooking the River Thames and dinner in a large private room. The Member of Parliament for Braintree in Essex, Brooks Newmark, was the kind host of the SIGTTO gathering and he regaled the directors with a stimulating speech at the dinner.



Brooks Newmark, MP, addresses the SIGTTO directors

There is a growing awareness that human factors need to be considered both in ship design and ship operation if we are to continue to expect crews to operate ships safely and effectively.

Human factors issues in shipping are diverse. With ever more complex systems installed onboard, issues with operability and usability are increasingly frequent. Operationally, concerns include the availability of competent crew, crew training and organisational management. Evidence suggests that these developments within the maritime industry are many, diverse and often incompatible. Hence consideration of human factors is imperative.

Compared to some ship segments, LNG shipping is more advanced in addressing certain human factors issues. The LNG segment's excellent safety record is the result of several factors, ranging from the underlying engineering through the operational procedures to the technical competence of operators.

However, like other segments, the LNG industry is in a period of change. The rapid expansion of the LNG sector, new security requirements, technological advances, increased ship sizes and potential labour supply constraints present a range of challenges to operational safety. In particular, these changes place new requirements on people, both on ship and ashore, thus putting pressure on the industry to place more emphasis on human factors.

From a technical perspective there have been great advances in ship design which have had a strong positive influence on safety. Proportionally fewer technical failures are attributed to accidents. However, equivalent improvements have not occurred from an operational perspective and attention needs to focus on considering the whole ship system. This means taking account of the people who work onboard if ship safety is to continue to improve.

One of the most effective ways that human factors can influence ship safety is through the inclusion of ergonomic requirements in ship design. Ergonomic design takes early account of the user in the design process. By designing out hazards before they become a risk, the likelihood of human error can be reduced and operator performance improved. Ergonomic design, however, is largely not considered in the marine industry. Typically, designers and naval architects have little or no training in occupational health and safety or work system design. This is a reason why the needs of the user are often omitted during the design process.

A big challenge for human factors specialists is to work towards eliminating



The maritime industry needs to make more use of ergonomic design, an approach which takes early account of the user in the design process

the risks associated with the ever-increasing influx of new technologies. As well as interfaces becoming increasingly complex, there are often large variations between equipment and vessels and a lack of integration between technologies onboard. This puts additional demands on operators, leading to information overload, reduced situational awareness and increased risk of error. By considering human factors in interface design, improvements in ship safety can be achieved through a better integration of crew and technology.

The traditional view, in which human error is seen as the individual responsibility of the officers and the crew, is simplistic and needs to change. There needs to be a move to recognise that the root cause of error can often be traced back into the management procedures of the operating company, and to the design and build stage in a ship's lifecycle. The continuous improvement of management

systems should seek out and take account of human-system issues. The early stages of a ship's lifecycle present effective and practical opportunities for mitigating some of the risks which the ship and its crew will otherwise face when it enters into service.

Although things are changing, the marine industry has a long way to go to catch up with other comparable high-hazard industries such as rail and aviation which have been proactive on the human factors front for years. Marine regulations are becoming increasingly focused on human factors which is forcing industry to take account of this important topic. Organisations that actively take steps now to address human factors issues will be best placed to succeed.

** Olivia Walker is Human Element Specialist with Lloyd's Register and a member of SIGTTO's Competency Assurance (Human Factors) Working Group.*

London Panel goes with the Grain

SIGTTO's 58th Panel Meeting, kindly hosted by National Grid Grain LNG, was held in London last October. The keynote speech was given by the IMO Secretary-General Koji Sekimizu. Around 200 members attended the two-day Panel which coincided with the Society's 68th General Purposes Committee meeting.

As is normal for SIGTTO Panel Meetings, the presentations revolved around items of topical interest to the gas shipping and terminal sectors. One particular benefit of these wide-ranging gatherings of key industry participants is the opportunity to share lessons learnt. Such lessons may not be known by all members.

The Society's invitation to former



Another Panel Meeting and another good turnout

general managers and technical advisers to attend the Panel dinner was widely taken up and it was most enjoyable to have so many of the SIGTTO family present.

A technical visit to the Isle of Grain LNG import terminal was organised for the day after the Panel Meeting. Members who made the trip were shown the terminal's maintenance facilities, the jetty, onsite storage tanks and the training simulator.

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Recent gas-related developments at IMO and EU

IGC Code update – Subject to some editorial clarifications, the draft revised International Gas Carrier (IGC) Code is scheduled for adoption at MSC 93 in May 2014, with a corresponding entry-into-force date of January 2016. The revised IGC Code will not be retroactive, and will apply only to vessels built after the entry-into-force date.

IGF Code update – Development of the International Code for Ships using Gas or other Low Flash-Point Fuels (IGF Code) continues to be progressed via correspondence group (CG). The primary focus of the CG remains the use of LNG as marine fuel, and although the CG is also addressing methyl alcohol and low-flash diesel fuels, that work will not delay the Code. Recent IMO sub-committee work has looked at the location of LNG bunker tanks (Ship Design & Construction Sub-committee) and STCW training requirements (Human Element, Training & Watchkeeping Sub-committee).

Realistically, the IGF Code is at least 12 months behind the IGC Code, as the drafting group is not scheduled to meet

Clarification is being sought on permissible fuels for steam turbine LNG carriers in North and Baltic Sea SECAs



until September 2014. IMO appears to be looking to fast track the IGF Code, with a target adoption date of spring 2015 and a resulting entry-into-force date sometime in the first half 2017. Once the work on the three fuels listed above is complete, other fuels such as LPG will be addressed.

EEDI for gas carriers – As reported in the last newsletter, amendments to MARPOL Annex VI were approved at the 65th Session of IMO's Marine Environment Protection Committee (MEPC65) in May 2013, to require LNG

carriers with a non-conventional propulsion type to comply with the EEDI regime. The entry-into-force date for these amendments is January 2016. Calculation and certification guidelines for implementation of these amendments will be considered at the next session of MEPC, in April 2014. On a related note, SIGTTO Technical Adviser Rick Boudiette will be presenting a paper on Gas Carrier EEDI at Gastech 2014 in March.

MARPOL Annex VI / Regulation 4 (Sulphur Equivalency) – The SIGTTO Secretariat, working with several members, is engaging the European Maritime Safety Agency (EMSA), the EU Committee on Safe Seas and the Prevention of Pollution from Ships (COSS) and IMO flag administrations, as well as various EU member states, in an attempt to clarify the application of MARPOL Annex VI, Regulation 4, for steam-propelled LNG carriers transiting the North Sea and Baltic Sea sulphur emission control areas (SECAs). The goal is to obtain EU agreement for using the EU Fuels Directive (for ships in port and at berth) alternative compliance method within the SECA zones. This would allow steam-propelled vessels to operate in dual fuel mode (boil-off gas and fuel oil) within the SECAs and preclude extensive modifications such as a separate distillate fuel systems and burner management modifications.

WORKING GROUPS

Projects at or near completion

The following paragraphs review the progress made by SIGTTO's latest four working groups. Their projects have either recently been completed or are nearing completion.

1 Competency Assurance for Key Staff involved with LNG Operations (Human Factors)

This working group (WG) was established at the 64th SIGTTO General Purposes Committee (GPC) meeting in September 2011. The WG first met in December 2011 and has had five further meetings since then. One of the principal tasks identified for the WG is to create guidelines entitled *Competency Assurance for Key Staff involved with LNG Operations*. The aim is to create a quality training regime based on the existing SIGTTO competency standards. Such a regime will require independent third party verification of training establishments and company systems.

Since the last update in the autumn

2013 edition of *SIGTTO News* a WG sub-group met with organisations that could carry out third party verification. Work is progressing on creating a high-level, goal-based document that would enable these organisations to carry out verification using their existing standards. This WG intends to complete its task by autumn 2014.

A separate article on human factors can be found on page 7.

2 Use of Support Vessels in the Emergency Response and Protection of Liquefied Gas Carriers and Terminals

This WG was established at the 66th GPC meeting in October 2012. It first met in December 2012 and there have since been four further meetings. The WG is tasked with defining the expected response, by emergency response craft, for incidents relating to liquefied gas carriers at terminals, including offshore terminals.

The WG is aiming to produce a publication and submit it for approval at the 70th GPC meeting in October 2014. This will enable the publication to be printed and available by the end of 2014.

3 High Modulus Synthetic Fibre (HMSF) Mooring Ropes

SIGTTO is pleased to announce that this WG has completed its task. The document was published in February 2014 and is available as a free download on the websites of SIGTTO and the Oil Companies International Marine Forum (OCIMF). SIGTTO would like to thank the WG members for their time and effort in compiling the guidance and bringing this project to fruition.

The working group was comprised of representatives from member companies of SIGTTO and OCIMF. In addition, rope manufacturers and suppliers, represented by the industry associations Cordage Institute and the European Federation of Rope, Twine and Netting Industries (EUROCORD), have provided valuable technical contributions.

4 Guidance for LNG carriers transiting the Panama Canal

This WG was established at the 67th GPC meeting in April 2013 and first met in May 2013. Three subsequent meetings were held, including the final meeting in January 2014. The document is now in the final stages of review and, if approved, will be available to purchase by mid-June 2014.

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NEW MEMBERS

Quartet onboard

Four companies have joined the SIGTTO membership since the last Newsletter was published. The new members and their date of joining the Society are shown below. The SIGTTO membership now stands at 135 full members, 39 associate members and 24 non-contributory members.

Harvey Gulf	1 Sep 2013
YPF	1 Nov 2013
Boluda Towage	1 Nov 2013
Gas Sayago	1 Jan 2014

Harvey Gulf International Marine

is a New Orleans-based shipowner providing vessel services for the offshore oil and gas industry. The company has six LNG-fuelled offshore support vessels (OSVs) under construction in the US. To serve these vessels Harvey Gulf is building a small-scale LNG terminal at Port Fourchon in Louisiana. This facility, which is set to become the first LNG bunkering station in the US, makes the company eligible for SIGTTO membership. Harvey Gulf is also a board member of SGMF.

YPF operates the Escobar LNG import terminal and four LPG terminals in Argentina. The Escobar terminal is near Buenos Aires and makes use of a floating storage and regasification unit (FSRU) to introduce delivered gas into the country's pipeline system.

Based at Valencia in Spain, **Boluda Towage** is a tug operator which, amongst other things, provides an escort tug service at six LNG import terminals. The portfolio comprises Fos (2) and Montoir in France, Huelva and Sagunto in Spain and Costa Azul in Mexico. The tug company is also contracted to provide similar services at a seventh terminal. This is the Dunkirk facility which is due to enter into service in 2015. Boluda Towage is the fourth tug operator providing LNG terminal escort services to join SIGTTO.

Gas Sayago SA of Uruguay will operate the Montevideo FSRU-based LNG import terminal once the facility is commissioned in 2015. An existing FSRU will be utilised for the first year of operations but this will be replaced in 2016 by a recently ordered FSRU newbuilding. With a capacity of 263,000m³, the new unit for Gas Sayago will be 50 per cent larger than any other FSRU in service. The Uruguayan company is SIGTTO's fourth South American member.

YES, BUT WHICH CAME FIRST?

The following two photos recently came to our attention. They say that imitation is the sincerest form of flattery but who is imitating whom?

We know that the 87,500m³ LNG carrier *Arctic Sun*, now renamed *Arctic Spirit*, was delivered in December 1993. However, as to the origins of the fishing boat *Arctic Sun*, we can trace no record.

As we're a gas shipping industry association, and recognising the high-risk nature of Alaskan fishing, our money is on the LNG ship as the first to have taken to the water. Please let us know if you have information to the contrary.

Our money is also on *Arctic Sun* the LNG carrier to achieve a longer lifespan, given its robust IHI SPB cargo containment system.



LNGC FLEET

Nearing the four century mark

The number of LNG carriers in service is about to pass the 400 mark. And, with over 100 such ships on order, the fleet should reach the 500 level sometime in the 2016-17 period. This is a remarkable achievement and is made all the more notable by the fact that as recently as 1997 the LNGC fleet numbered only 100 vessels.

When considering the growth of this fleet, the figures 33, 7, 3 and 5 are worth noting. These are the number of years it has taken to reach each of the vessel century milestones. It took 33 years for the ships-in-service fleet to reach 100 vessels but only three years for the jump from 200 to 300 ships. This was the quickest century leap,

although the upcoming progression from 400 to 500 is set to be a similarly rapid one.

Five years ago, on delivery in December 2008, the 155,000m³ *Tangguh Jaya* became the 300th vessel in the then in-service LNGC fleet. As this edition of SIGTTO News was going to press, the current fleet was about five ships short of the 400 mark. Because there are a number of newbuildings now approaching their completion dates and because it is possible that one or two older vessels could be sold for scrap at any stage, it is impossible to say with any certainty which new LNG carrier will be the next milestone ship.

As soon as the vessel is known, and the news is expected within weeks, there will undoubtedly be a proud shipowner, shipbuilder and range of equipment suppliers extolling their links with the landmark ship.

Total - a historic player



A pioneer in the LNG industry, Total today is one of the world's leading players in the sector, with sound and diversified positions both in the upstream and downstream portions

of the LNG chain. Through its stakes in liquefaction plants in Qatar, the United Arab Emirates, Oman, Nigeria, Norway, Yemen and Angola and its gas supply agreement with the Bontang LNG plant in Indonesia, Total markets LNG in all markets worldwide.

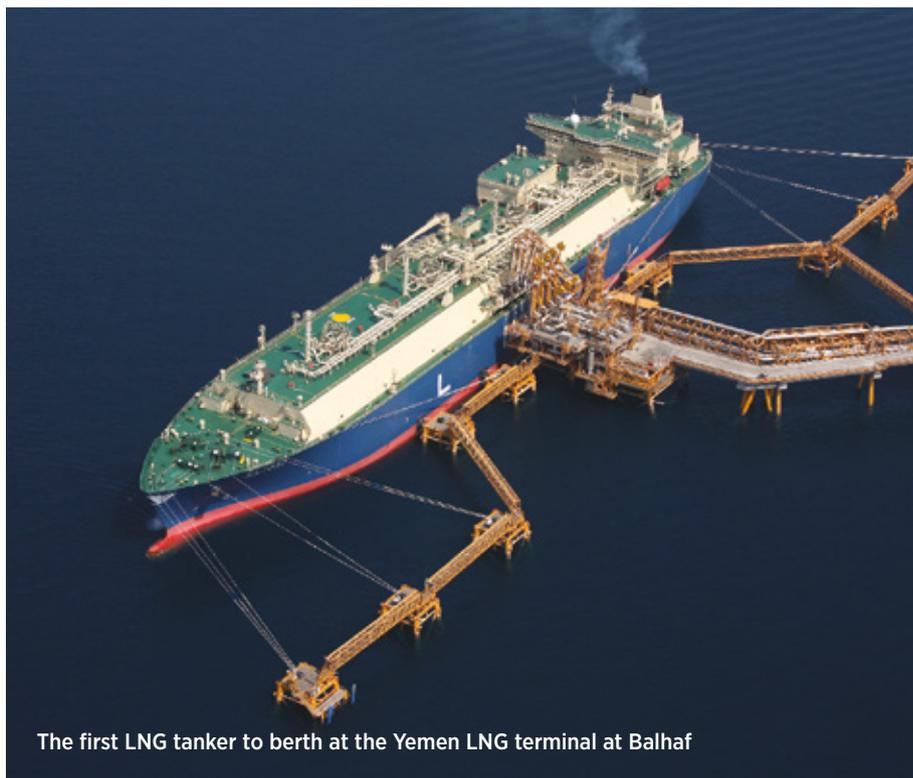
Total has a presence at 10 LNG export terminals and as a result of its shares in these projects the volume of LNG sold by the company in 2013 reached 12.3 million tonnes. The Group's forthcoming liquefaction projects, in particular the Ichthys LNG and Gladstone LNG schemes in Australia and Yamal LNG in Russia, are aimed at increasing Total's share of LNG sold worldwide over the coming years.

Late in 2013 the Group announced the final investment decision for the onshore Yamal LNG project in Russia. This will strengthen Total's global portfolio, not least by sustaining production in the decades after 2017 and further increasing the company's presence in a region of Russia with high gas potential. The Group has also secured LNG purchases from the Sabine Pass liquefaction plant now building in the US.

Total's access to markets is provided through reserved regasification capacity at six import terminals, one of which is under construction, and long-term sales contracts in key LNG markets.

Total is also very active in LNG transportation through its partnerships in a large number of projects. The company is involved in inspecting more than 70 of the 390 LNG carriers in the current world fleet, either as co-owner or under long-term charter agreements. Total is also chartering LNG carriers directly to deliver the cargoes sold by the Group's trading teams. *Arctic Lady* has been on charter since 2004 and *Meridian Spirit* since 2011 and both are involved in lifting Total's share of production from the Snøhvit liquefaction plant in Norway.

In addition Total signed a long-term charter agreement in April 2013 with SK Shipping and Marubeni for two 182,000m³ LNG carriers. The vessels will serve in fulfilling the purchase agreements of Total Gas & Power, including commitments relating to the Ichthys LNG project in Australia and the Sabine Pass project in the US. These tankers, scheduled for delivery in 2017, will be among the largest to navigate the Panama Canal



The first LNG tanker to berth at the Yemen LNG terminal at Balhaf

PHOTO COPYRIGHT THIERRY GONZALEZ

following its anticipated enlargement in 2015.

Over the next 10 years natural gas will be called upon to meet an increasing proportion of the world's energy needs and in the form of LNG it offers numerous advantages in terms of transport and delivery flexibility. LNG will constitute an essential element of this rise in gas supply in response to growing demand in many areas like Asia, Europe and the Middle East.

North America remains by far the leading gas market and has now become largely self-sufficient through the exploitation of its shale gas resources while Asia and Europe have rapidly become the most important regions for LNG imports. More recently Asia has been the primary driver for growth while the economic malaise that Europe is currently suffering has reduced the demand for LNG. North America, expected to become a major LNG importer until recently, is now on the verge of becoming a leading exporter.

The current situation is highlighted by the fact that Asian customers accounted for 74 per cent of the trade in LNG in 2013. The traditional Asian import nations of Japan, Korea and Taiwan have been joined more recently by China and India and the latter two nations are likely to experience particularly strong growth in their LNG imports in the years ahead. The requirement for gas in both countries is large and growing rapidly and domestic production and pipeline imports will be unable to bridge the gap between supply and demand.

In addition European LNG imports are set to make a comeback in the near future. A

continued decline in North Sea gas output and the introduction of increasingly strict environmental legislation will support the cause of European LNG imports.

Total is currently positioned along the whole LNG chain, from gas production and marketing to shipping and delivery to industrial end users. The Group, with its global coverage in the LNG sector, stands poised to match customer requirements with gas supplies in the years ahead, wherever in the world it may be called upon to do so.

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